Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Correspondence

Encephalitis Associated with COVID-19 Infection in an 11-Year-Old Child

To the Editor,

Neurological complications associated with COVID-19 infection are not well understood in children or adults. An adult with acute necrotizing encephalitis associated with COVID-19[1] and a child with acute disseminated encephalomyelitis and non-COVID coronavirus[2] have been reported. The infection is typically mild in children, and no neurological complications were reported in the 171 children from Wuhan Children's Hospital.[3] In preliminary data from US cases, headache was the only neurological symptom.[4] We describe an 11-year-old previously well child who presented with status epilepticus requiring four anticonvulsant medications and cerebrospinal fluid evidence for encephalitis (921 red cells, 16 white cells, 8% neutrophils [normal 0% to 6%] with protein of 97 [normal: 40 to 170 mg/dL], and glucose of 92 [normal: 20 to 100 mg/dL]). He had a two-day history of generalized weakness without respiratory symptoms or fever at home; emergency room temperature was 102.7°F. Head computed tomography was negative. Electroencephalography revealed frontal intermittent delta activity. Nasopharyngeal swab was positive for COVID-19 as well as rhinovirus/enterovirus but the latter was absent in cerebrospinal fluid polymerase chain reaction. Recovery without treatment was complete in six days.

We believe this is the first child reported with COVID-19 viral encephalitis, and the condition was reversible. How coronavirus affects the brain is not known. This child's findings suggest that direct brain infection may be possible. An autoimmune process may also be possible. The acuteness of our patient's neurological manifestations coupled with the occurrence of fever and generalized systemic weakness mitigates against a postinfectious process. Because the virus binds the surface spike protein to the human angiotensin-converting enzyme 2 receptor (ACE-2) and ACE-2 is present in the brain vascular endothelium, a vascular process with clotting and infarction may also be possible, although this was not the mechanism in our patient.[5-7] Although preliminary, we recommend screening children presenting with encephalitis for COVID-19 as infected patients require special precautions to prevent further spread.

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